Himalayan zone is found to be associated, not only with the subsequent conditions already named, but also with an *initially*, and therefore according to experience *subsequently* weak south-west monsoon, which in its turn invariably causes local, if not general drought and famine. These heavy snowfalls are found to have a tendency to recur at the minimum sun-spot epochs, and are proximately due to some condition of the upper anti-monsoon current, at present not exactly known, by which a larger amount of vapour is deposited in the winter, on the Himalaya as snow, and on the North Indian plains as the "winter rains."

It does not appear that we can so readily account for the occurrence of the present ice-floes off Ireland or for the large masses which have been encountered this spring in the Western Atlantic. They must however to some extent be due to the unusually warm winter which seems to have prevailed pretty uniformly over the North Atlantic and North-West Europe, and which has detached a larger proportion than usual of the Arctic ice-fields. And though it is improbable that we shall find any such regular periodicity in the amount of these ice-floes in the Atlantic as in that of the Indian winter snows and rains, it is worthy of notice to observe that they have a decided tendency to occur to an unwonted extent about the times of maximum sun-spot—like the present. Thus Prof. Fritz, of Zurich,[1] gives the following as the list of years in which floating ice was found most abundantly in the lower latitudes of the North Atlantic :—

Years of greatest frequency of floating ice.	Epochs of maximum sun-spot.
1789	1788·1
	1804·2
1816–18	1816·4
1828–29 }	1829 9
1831 }	
	1837·2
	1848·1
1862–64	1860·1
1868 }	1870·6
1869 }	

It is also interesting to notice that in 1862 Heis's "Wochenschrift" mentions that the floating ice-masses in the Atlantic caused "a noticeable cooling of the weather in *June* over Europe." And it is further significant to find in a detailed list of the ice met with every month in the Atlantic by ships belonging to the North German lines from 1860 to 1869, that 1868 and 1869 (the year in which similar weather to the present is mentioned as having been observed by the writer of the paragraph in NATURE) were the years in which the greatest quantity of ice was encountered. Though I agree with Dr. Hann in attributing more importance to the *tropical* than to the *polar* area, in influencing the *general* weather of these latitudes, I think it very probable on theoretical grounds that we are relatively more influenced by the *latter* area in *summer* and by the *former* in *winter*, and that just as it has been inferred that the regular recurrence of periods of diminished temperature in Europe, is due to the regular movements of the ice in the polar area so we may reasonably conclude that abnormal movements of the ice, especially in the Spitzbergen area, are likely to produce periods of abnormal coolness such as that which at present prevails. In any case the moral to be drawn, if we really do intend to solve the weather problem, is by all means to have a meteorological station in Iceland, and endeavour to study the weather as we are fortunately able to do in India, on a *large scale*, instead of merely confining our attention to the minute range of conditions we are able to observe within the limited area of these islands.

E. DOUGLAS ARCHIBALD

The Analysis of the Tuning Fork

IN NATURE last week there is a short description of Mr. W. F. Stanley's well-devised experiments, by which the tuning-fork "is shown not to depend upon a vibrating ventroid."

Few persons would readily obtain the experimental steel rod, or would care to attempt the feat of sawing through the bend of the fork down into the stem, and some musical readers may like to know that (missing, of course, the pretty effects) there is a less arduous way of arriving at the conclusion to which Mr. Stanley has directed attention. By very simple experiments I have been accustomed to show that Chladni's analysis, as generally accepted, is not in all particulars borne out by the evidence of facts. If a vibrating tuning fork is held in its upright position by means of a knife-blade passed through the prongs, pressing upon the inner bend so that the stem is in contact with the table, without its being held by the fingers, there will be a communication of vibrations fully as strong as when held in the usual manner, with variation of intensities according to differences in the degrees of pressure. In this experiment the fork at its bend is subjected to pressure both above and below. The argument, therefore, is that the existence of a segment in transversal vibration, occupying the bend of the fork as figured in Chladni's analysis, is incompatible with the evidence. As in all musical instruments, the communicating of transversal vibrations from one solid to another is invariably through the nodes, and as segments are always destroyed by firm pressure, it seems clear that the analysis should be amended. If a vibrating fork is drawn across a stretched string with pressure, the prong passing from the bend towards the point or end, the integrity of the vibrations of the fork is not impaired, and there is but a slight transference of vibration to the string; but it is otherwise with respect to a stretched wire, as when the prong comes into contact with the wire, its vibrations cease; the wire will not be subordinated to the coercive activity of the prong as the string is; yet if the fork is placed with the prongs astride the wire, so that the bend, at the seat of the alleged segment, rides upon the wire, the wire readily conveys the vibrations, and acts as a sound-post. It may be shown that the stem of the fork acts likewise as a sound-post, since we may substitute a free stem; if a vibrating fork is held by the stem, and if through the prongs another fork has the shoulder of its stem pressed upon the bend, then, when the point of this second stem is brought into contact with a solid, the vibrations of the fork are transmitted through it from the bend, with nearly the strength of tone as would be produced by the original fixed stem. The stem itself may be dispensed with as a part of the system, for if the fork is held so that the external part of the bend, where it joins the stem, is pressed against the edge of a table or other solid, its vibrations are not interfered with; neither is the strength of tone diminished, except as in each of these instances, varying in the usual way according to the degree of pressure. HERMANN SMITH

June 19

"Combing" of Waves

ALL who have watched waves breaking on the sea-shore must have noticed the furrowed or "combed" appearance of the back of a wave as it curls over. If the water is not much disturbed by wind, it is seen, on attentive watching, that this "combing" appears suddenly, and begins at the advancing edge of the crest, and spreads backwards. With small waves a foot or so in height and of long extended front, such as are seen in shallow water, it may be observed that the crest, which in this case rolls down the front of the wave, is at first smooth and even, while the back of the wave is also smooth and unfurrowed, but the edge of the crest suddenly becomes crenated, and almost simultaneously the combing appears on the back of the wave, travelling rapidly backwards from the crenated edge. Moreover a considerable length of the wave appears to be similarly affected almost at the same instant. With larger waves, whose crest falls rather than rolls upon the concave front, I have observed that the edge is at first smooth and even, but that it suddenly becomes uneven, and often fringed with a row or rows of drops, and that at the same instant the combing appears. In both cases, if there is much wind, the regularity of the phenomenon is disturbed, and observation is in other ways rendered difficult. The action is so exactly parallel to something which takes place in the splash of drops, and which I have described in detail in a paper recently read before the Royal Society (see *Proc. Roy. Soc.*, No. 218), that I think your readers may be interested in a brief statement, with special reference to this more familiar case of waves, of the explanation there put forward. The explanation amounts to this :—It is well known that a long cylinder of liquid is unstable, and will, if left to itself, at once tend to split into a row of equal, equidistant drops; the splitting being effected by a constriction of the cylinder in certain places, and a bulging out in others. Again, if a mass of liquid is bounded by an edge whose surface is approximately a portion of a long cylinder, there is good reason for supposing that this cylindrical edge will be subject to similar laws of stability, and that it will tend to cleave in the same way, the surface being forced in in certain places, and out in others. Now a wave's crest presents such a cylindrical edge.

[1] In his work, "Ueber die Beziehungen der Sonnen flecken-periode zu den Meteorologischen und Magnetischen Erscheinungen," p. 175.

© 1882 Nature Publishing Group

It will, therefore, of itself, cleave in the way described, and the flow of water will thereby be hindered at the constrictions, and aided at the places of bulging out. Thus lines of easiest flow will be set up, which in their turn will determine the furrows on the back of the wave. The fringe of drops is due to the splitting in a similar manner of the cylindrical jets shot out from the places of bulging, where the flow is aided. Indeed, much of the seething at the edge of a wave is, I think, attributable to the breaking up of such jets in this manner. In the case of the minute phenomenon of a drop-splash, I have been able, in some degree, to bring this explanation to the test of measurements, which, so far as they go, quite confirm it. The regularly-toothed edge of a spot of candle-wax that has fallen on a cold object, affords in a permanent form a familiar illustration of the same action.

A. M. WORTHINGTON

Clifton College, Bristol, June 20

THE SEAL ISLANDS OF ALASKA[1]

TEN years have only just elapsed since the Government of the United States of America obtained by treaty the territory of Alaska, including the seal islands situated off its coast in the Bering Sea, and at that time although the sealskin trade occupied thousands of hands, and had done so for at least a century previous, yet next to nothing was known of the animal producing the skins, and there was not, even in the museum of the Smithsonian Institution, a perfect skin and skeleton thereof. This state of things has happily now vanished, and through the joint action of Prof. Spencer Baird and the Secretary of the Treasury of the United States, Mr. Henry W. Elliott, was enabled to visit the Pribylov Islands in 1872, and we cannot but admire the zeal and energy which enabled him to reside in these dreary and desolate places all through the seasons of 1872 to 1874 inclusive. While a brief digest of Mr. Elliot's notes were published in 1874, it is only now that he has been enabled to publish a complete monograph on the subject, an emended copy of which, reprinted from the Report on the Fishery Industries of the Tenth Census at Washington in this year, is now before us. It forms a quarto volume of some 176 pages, and is illustrated by two maps and twenty-nine plates of subjects from the author's pencil. The writer's opportunities for observation, it will be noticed, were especially good. The previous observations of Stellar and others left much to be desired. The geographical distribution of the Arctic fur seal (Callorhinus) is very peculiar. In the Arctic waters of the Atlantic they have not been found, in the corresponding waters of the Pacific they are virtually confined to four islands in Bering's Sea, namely St. Paul and St. George of the tiny Pribylov group, and Bering and Copper Islands of the Commander group. On the former two they swarm. On the latter two, though the larger in area, the seals do not occur in such quantities. It seems impossible to avoid the reflection here as to the waste of fur seal life in the Antarctic regions, and along the coasts of South America, from which, as a centre, the Arctic forms, probably, originally came. Not a century ago the fur seals rested on the Falkland Islands in millions for hundreds that are to be found there now, and it seems hopeless to expect that a British parliament could, with all its many labours, trouble itself to frame regulations, such as the Russians and Americans have done, with the object of repeopling, even in time, these splendid breeding-grounds which, on the Falklands, lie in the very track of commerce, and which, unlike the Alaskan Islands, have beautiful and safe harbours.

The Pribylov Islands were discovered by the hardy navigator whose name they bear, in 1786, and one of the islands is called after his sloop, the *St. George*. He took possession in the name of Russia. Almost striking against the island in a fog, the sweet music to his ears of numerous seal rookeries was wafted towards him. For a little time he kept his secret; but he was soon watched, and his treasure had to be shared with others. These islands lie in the heart of Bering Sea; they are just far enough south to be beyond the reach of permanent ice-floes, upon which the Polar bears could have reached them. Fog banks shut out the sun nine days out of ten during summer, and the breeding season. By the middle of October strong, cold winds from the Siberian Steppes sweep across them. By the end of January great fields of sludgy, broken ice bear down on them; and from December to May, or June, they lie ice-bound. It is owing to this constant, cold, moist, shady, gray weather, that these islands are frequented by such millions of the fur seals. Let the sun but shine out, and the temperature rise to 60° F., or 64° F. in the shade, and both seals and natives are at once incommoded by the glare and heat. During the winter of 1872-73 Mr. Elliott, while watching with all the impatience which a man in full health and tired of confinement can possess, to seize every opportunity upon quiet intervals between the storms of sleet, in order to make a short trip for exercise, only got out *three* times, and then only by the exertion of great physical energy. On one occasion the temperature sank to $-4°$, and the wind velocity, as recorded by one of the Signal Service anemometers, was at the rate of 88 miles per hour. This storm lasted for six days. The average summer temperature is between 46° and 50° F. in ordinary seasons. The cloud effects are, as might be anticipated, something wonderful, but the aurora is scarcely to be seen. The islands are of volcanic formation; their vegetation seems interesting, and algæ (seaweeds) seem to abound. This is the weakest part of the author's report, and it would be well worthy of the Smithsonian Institute to have the whole flora of these islands carefully investigated. Only a few very hardy vegetables are raised on St. Paul's. As yet, rats seem not to have landed on the islands, though mice have become troublesome, and the cats brought to keep the mice in order, have by inordinate indulgence in meat (seal) eating, become wonderfully altered; they are described as "stubby balls," having become thickened, short, losing the greater portion of their tails (in the second and third generations), and their voices are altered into a prolonged, fearful cry, that surpasses anything ever heard in these countries. So bad is this caterwauling, that it even at times arouses the wrath of the sluggish Aleutians. Foxes and lemmings abound on St. George; the latter are not found at St. Paul's. Birds abound, and though fishes are scarce, invertebrate life in the waters of the group seems abundant. The "natives" of the island were about 400 in number in 1880, of whom some eighteen were whites (Russian), and the rest Aleutians. The births never equalled the deaths, but they are constantly being recruited by the Alaskan Commercial Company. Now-a-days the people are comfortably housed and well clothed. Seal meat is their staple food; and by the regulation of the Treasury they can kill, every autumn, an average of twenty-three to thirty young seals for each man, woman, and child in the settlement. As each pup averages ten pounds of good meat, this would show an average of about 600 pounds of flesh meat for each. To this diet they add butter, sweet crackers, and sugar. They are passionately fond of butter. No epicure could appreciate good butter more than these people, and the sweetest of all sweet teeth are to be found in the jaws of an Aleut. The Company allows them fairly liberal supplies of these, also rice and tobacco. As an illustration of the working ability of the natives on the seal grounds, the following shows the actual time occupied by them in finishing up the three seasons' work which Mr. Elliott personally supervised on St. Paul's Island.

In 1872,	50 days'	work of	71 men	secured 75,000 skins.
In 1873,	40 ,,		71 ,,	75,000 ,,
In 1874,	36 ,,		84 ,,	90,000 ,,

[1] "A Monograph of the Seal Islands of Alaska," by Henry W. Elliott. Reprinted, with Additions, from the Report on the Fishery Industries of the Tenth Census (U.S. Commission of Fish and Fisheries). Washington, February, 1882.

© 1882 Nature Publishing Group